

## STANDARDS

### **VOLUME TO CAPACITY RATIOS AND LEVEL OF SERVICE**

The Volume to Capacity (V/C) ratio is an important measure of roadway congestion. Capacity is the maximum number of vehicles that can pass over a given section of a roadway during a given time period (one hour unless otherwise specified), under prevailing roadway and traffic conditions. Volume to Capacity ratios range from 0 (no congestion) to greater than 1.0 (severe congestion). The V/C ratios are further tied to an indicator of congestion called Level of Service (LOS). Level of Service is broken into six categories, A through F. As the V/C ratio rises, the Level of Service decreases. Level of Service categories, have the following characteristics.

LOS	DESCRIPTION
A	Free flow. Level A represents high speed, smooth flow with little or no interference between vehicles.
B	Lower speeds than LOS A, although flow is still good and little congestion exists. In urban areas, average over-all speeds drop due to intersection delay and vehicular conflicts.
C	Lower speeds than LOS B, although flow is still good and little congestion exists. Operation is still stable with acceptable delays, but becoming more critical.
D	Level D shows still lower speeds than previous levels. There is some congestion, and conditions become slightly unstable with respect to travel time and delay. The traffic flow is beginning to tax the capabilities of the street section. In urban and suburban areas, delays at intersections may be extensive with some cars waiting two or more cycles.
E	The traffic flow is unstable, and the traffic volumes are at capacity. Any momentary stoppage may create an immediate and significant amount of congestion. Traffic is backed up continuously at intersection approaches.
F	Level of service F is demonstrated by conditions of heavy congestion and stop-and-go traffic. All intersections are handling traffic in excess of capacity. Vehicular back-ups extend back from signalized intersections, through unsignalized intersections.

When designing new roadways, ITD designers strive to provide the highest level of service feasible. Generally, in rural areas, new roadways are designed to meet Levels of Service B or C. In heavily developed urban and suburban areas, Level of Service C or better is desirable. However, conditions may necessitate the use of Level of Service D.

See the *Highway Capacity Manual* for detailed discussions of Level of Service and Volume to Capacity ratios.

### **Recommended Roadway and Right-Of-Way Widths**

Page 30 shows a map of the recommended roadway and right-of-way widths for rural highways. When existing roadways are reconstructed, it is ITD's goal that the roadway be constructed to the widths shown on this map. This map takes into account AASHTO (American Association of State Highway Transportation Officials) design standards, but modifies these standards, as required, due to terrain constraints.